

Irina Gaynanova

irinagain.github.io

September 3, 2023

Research interests

Statistical/machine learning, data integration, high-dimensional biomedical data, multivariate analysis, computational statistics, applications to multi-omics data and data from wearable devices (continuous glucose monitors, ambulatory blood pressure monitors, activity trackers).

Education

- Ph.D, Statistics 05/2015
Cornell University, Ithaca, NY
Advisors: James Booth and Martin Wells
- M.S., Statistics 05/2013
Cornell University, Ithaca, NY
- Diploma with honors (M.S.), Applied Mathematics and Computer Science 06/2009
Lomonosov Moscow State University, Moscow, Russia

Professional Positions

- Associate Professor (*with tenure*) since 09/2023
Department of Biostatistics, University of Michigan
- Adjunct Associate Professor since 09/2023
Department of Statistics, Texas A&M University
- Associate Professor (*with tenure*) 09/2021 - 08/2023
Department of Statistics, Texas A&M University
- Assistant Professor 07/2015 - 08/2021
Department of Statistics, Texas A&M University
- Senior Specialist 06/2009 - 07/2010
Balancing Market Division, OJSC Trading System Administrator, Moscow, Russia
- Junior Statistician 06/2008 - 05/2009
Census Division, AC Nielsen, Moscow, Russia

Awards and Honors

- NSF CAREER Award 2021
- Dr. Judith Edmiston Mentoring Award, College of Science, Texas A&M University 2021
- DeBakey Executive Research Leadership Certification, Texas A&M University 2021
- David P. Byar Young Investigator Award, ASA Biometrics Section 2018
- Cornelia Ye Outstanding Teaching Assistant Award, Cornell University 2014
- EducationUSA Opportunity Award 2009
- Study Abroad Scholarship, Technical University of Munich, Germany 2007

Competitive Travel Awards

- IMS New Researchers Conference 2017
- NISS Writing Workshop for Junior Researchers 2016
- SAMSI LDHD Summer School Program 2013
- Building Future Faculty Program, NC State University 2013
- Diversity and Mentoring Program at JSM 2012

Publications and Submitted Manuscripts

Note on authorship: the sign * at the beginning of a paper indicates alphabetical order of authorships; the sign + indicates co-first authorships; underline denotes mentored student or post-doctoral associate; the sign ☒ denotes the corresponding author.

Submitted Manuscripts:

36. Wang Z., **Gaynanova I.**, Aravkin A. and Risk B. ☒ (2023+) "Sparse Independent Component Analysis with an Application to Cortical Surface fMRI Data in Autism." Submitted.
35. Sergazinov R. ☒, Chun E., Rogovchenko V., Fernandes N., Kasman N. and **Gaynanova I.** (2023+) "GlucoBench: Curated List of Continuous Glucose Monitoring datasets with Prediction Benchmarks." Submitted.
34. Chung H.C., Ni Y. and **Gaynanova I.** ☒ (2023+) "Sparse semiparametric discriminant analysis for high-dimensional zero-inflated data." Preprint available on [arXiv:2208.03734](https://arxiv.org/abs/2208.03734).
33. Yuan D., Zhang Y., Guo S., Wang W. and **Gaynanova I.** ☒ (2023+) "Exponential canonical correlation analysis with orthogonal variation." Preprint available on [arXiv:2208.00048](https://arxiv.org/abs/2208.00048).

Peer-reviewed Publications:

32. Yi S., Wong R. and **Gaynanova I.** ☒ (2023+) "Hierarchical nuclear norm penalization for multi-view data integration." *Biometrics*, accepted.
Link: <https://doi.org/10.1111/biom.13893>
31. Sergazinov R., Leroux A., Cui E., Crainiceanu C., Aurora R., Punjabi N. and **Gaynanova I.** ☒ (2023+) "A case study of glucose levels during sleep using fast function on scalar regression inference." *Biometrics*, accepted.
Link: <https://doi.org/10.1111/biom.13878>
30. Sergazinov R. ☒, Armandpour R. and **Gaynanova I.** (2023) "Gluformer: Transformer-based personalized glucose forecasting with uncertainty quantification." *2023 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*.
Link: <https://doi.org/10.1109/ICASSP49357.2023.10096419>
29. Zhang Y. and **Gaynanova I.** ☒ (2022) "Joint association and classification analysis of multi-view data." *Biometrics*, Vol. 78, No. 4, 1614-1625.
Link: <https://doi.org/10.1111/biom.13536>
28. Yuan D. and **Gaynanova I.** ☒ (2022) "Double-matched matrix decomposition for multi-view data." *Journal of Computational and Graphical Statistics*, Vol. 31, No. 4, 1114-1126.
Link: <https://doi.org/10.1080/10618600.2022.2067860>

27. Chung H.C., **Gaynanova I.** and Ni Y. (2022) "Phylogenetically informed Bayesian truncated copula graphical models for microbial association networks." *Annals of Applied Statistics*, Vol. 16, No. 4, 2437-2457.
Link: <https://doi.org/10.1214/21-AOAS1598>
26. Schwenck J., Punjabi N. and **Gaynanova I.** (2022) "bp: Blood Pressure analysis in R." *PLoS One*, Vol. 17, No. 9, e0268934.
Link: <https://doi.org/10.1371/journal.pone.0268934>
25. Aurora R. N., **Gaynanova I.**, Patel P., and Punjabi N. M. (2022). "Glucose profiles in obstructive sleep apnea and type 2 diabetes mellitus." *Sleep Medicine*, Vol. 95, 105-111
Link: <https://doi.org/10.1016/j.sleep.2022.04.007>
24. Fernandes N., Nhan, N., Chun, E., Punjabi N. and **Gaynanova I.** (2022) "Open-source algorithm to calculate mean amplitude of glycemic excursions using short and long moving averages." *Journal of Diabetes Science and Technology*, Vol. 16, No. 2, 576-577.
Link: <https://doi.org/10.1177/19322968211061165>
23. **Gaynanova I.**, Punjabi N. and Crainiceanu C. (2022) "Modeling continuous glucose monitoring (CGM) data during sleep." *Biostatistics*, Vol. 23, No. 1, 223-239.
Link: <https://doi.org/10.1093/biostatistics/kxaa023>
22. Lapanowski A. and **Gaynanova I.** (2021) "Compressing large-sample data for discriminant analysis." *2021 IEEE International Conference on Big Data (Big Data)*, 1068-1076.
Link: <https://doi.org/10.1109/BigData52589.2021.9671676>
21. Huang M., Müller C. and **Gaynanova I.** (2021) "latentcor: An R package for estimating latent correlations from mixed data types." *Journal of Open Source Software*, Vol. 6, No. 65, 3634.
Link: <https://doi.org/10.21105/joss.03634>
20. Risk B. and **Gaynanova I.** (2021) "Simultaneous non-Gaussian component analysis (SING) for data integration in neuroimaging." *Annals of Applied Statistics*, Vol. 15, No. 3, 1431-1454.
Link: <https://doi.org/10.1214/21-AOAS1466>
19. Yoon G., Müller C. and **Gaynanova I.** (2021) "Fast computation of latent correlations." *Journal of Computational and Graphical Statistics*, Vol. 30, No. 4, 1249-1256.
Link: <https://doi.org/10.1080/10618600.2021.1882468>
18. Solhjoo S., Punjabi N., Ivanescu A., Crainiceanu C., **Gaynanova I.**, Wicken C., Buckenmaier C., and Haigney M. (2021) "Methadone destabilizes cardiac repolarization during sleep." *Clinical Pharmacology & Therapeutics*, Vol. 110, No. 4, 1066-1074.
Link: <https://doi.org/10.1002/cpt.2368>
17. Broll S., Urbanek J., Buchanan D., Chun E., Muschelli J., Punjabi N. and **Gaynanova I.** (2021) "Interpreting blood glucose data with R package iglu." *PLoS one*, Vol. 16, No. 4, e0248560.
Link: <https://doi.org/10.1371/journal.pone.0248560>
16. Taylor N., **Gaynanova I.**, Eschrich S., Welsh E., Garrett T., Beecher C., Sharma R., Koomen J., Smalley K., Messina J., Kanetsky P. (2020) "Metabolomics of primary cutaneous melanoma and matched adjacent extratumoral microenvironment." *PLoS one*, 15(10):e0240849.
Link: <https://doi.org/10.1371/journal.pone.0240849>
15. Yoon G., Carroll R. and **Gaynanova I.** (2020) "Sparse semiparametric canonical correlation analysis for data of mixed types." *Biometrika*, Vol. 107, No. 3, 609-625
Link: <https://doi.org/10.1093/biomet/asaa007>

14. **Gaynanova I.** (2020) "Prediction and estimation consistency of sparse multi-class penalized optimal scoring." *Bernoulli*, Vol. 26, No. 1, 286-322.
Link: <https://projecteuclid.org/euclid.bj/1574758829>
13. **Gaynanova I.** and Li G. (2019). "Structural learning and integrative decomposition of multi-view data." *Biometrics*, Vol. 75, No. 4, 1121-1132.
Link: <https://doi.org/10.1111/biom.13108>
12. * Bien J., **Gaynanova I.**, Müller C. and Lederer J. (2019). "Prediction error bounds for linear regression with the TREX." *TEST*, Vol. 28, No. 2, 451-474.
Link: <https://doi.org/10.1007/s11749-018-0584-4>
11. Yoon G., **Gaynanova I.** and Müller, C. (2019) "Microbial networks in SPRING - Semi-parametric rank-based correlation and partial correlation estimation for quantitative microbiome data." *Frontiers in Genetics*, Vol. 10, 516.
Link: <https://doi.org/10.3389/fgene.2019.00516>
10. Lapanowski A. and **Gaynanova I.** (2019) "Sparse feature selection in kernel discriminant analysis via optimal scoring." *Proceedings of the 22nd International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 89, 1704-1713.
Link: <http://proceedings.mlr.press/v89/lapanowski19a.html>
9. Lederer J., Lu Y. and **Gaynanova I.** (2019). "Oracle inequalities for high-dimensional prediction." *Bernoulli*, Vol. 25, No. 2, 1225-1255.
Link: <https://projecteuclid.org/euclid.bj/1551862849>
8. **Gaynanova I.** and Wang T. (2019) "Sparse quadratic classification rules via linear dimension reduction." *Journal of Multivariate Analysis*, Vol. 169, 278-299.
Link: <https://doi.org/10.1016/j.jmva.2018.09.011>
7. **Gaynanova I.**, Urbanek J. and Punjabi N. (2018). "Letter to the Editor: Corrections of equations on glycemic variability and quality of glycemic control." *Diabetes Technology & Therapeutics*, Vol. 20, No. 4, 317.
Link: <https://doi.org/10.1089/dia.2018.0057>
6. Li G. and **Gaynanova I.** (2018). "A general framework for association analysis of heterogeneous data." *Annals of Applied Statistics*, Vol. 12, No. 3, 1700-1726.
Link: <http://doi.org/10.1214/17-AOAS1127>
5. * Bien J., **Gaynanova I.**, Müller C. and Lederer J. (2018). "Non-convex global minimization and false discovery rate control for the TREX." *Journal of Computational and Graphical Statistics*, Vol. 27, No. 1, 23-33.
Link: <https://doi.org/10.1080/10618600.2017.1341414>
4. Hokamp J., Leidy S., **Gaynanova I.**, Cianciolo R. and Nabity M. (2018) "Correlation of electrophoretic urine protein banding patterns with severity of renal damage in dogs with proteinuric chronic kidney disease." *Veterinary Clinical Pathology*, Vol. 47, No. 3, 424-434.
Link: <https://doi.org/10.1111/vcp.12648>
3. **Gaynanova I.**, Booth J. and Wells M. (2017). "Penalized versus constrained generalized eigenvalue problems." *Journal of Computational and Graphical Statistics*, Vol. 26, No. 2, 379-387.
Link: <https://doi.org/10.1080/10618600.2016.1172017>

2. **Gaynanova I.**✉, Booth J. and Wells M. (2016). "Simultaneous sparse estimation of canonical vectors in the $p \gg n$ setting." *Journal of the American Statistical Association*, Vol. 111, No. 514, 696-706.
Link: <http://doi.org/10.1080/01621459.2015.1034318>
1. **Gaynanova I.**✉ and Kolar M. (2015). "Optimal variable selection in multi-group sparse discriminant analysis." *Electronic Journal of Statistics*, Vol. 9, No. 2, 2007-2034. Link: <http://doi.org/10.1214/15-EJS1064>

Unrefereed Manuscripts:

3. **Gaynanova I.**✉ (2022) "Digital biomarkers of glucose control - reproducibility challenges and opportunities." *Biopharmaceutical Report*, Vol. 29, No. 1, 21-26.
2. **Gaynanova I.** (2015). "Estimation of sparse low-dimensional linear projections." Ph.D. Thesis, Cornell University.
1. **Gaynanova I.**, Booth J. and Wells M. (2013). "Supervised classification using sparse Fisher's LDA." Technical report, [arXiv:1301.4976 \[stat.ML\]](https://arxiv.org/abs/1301.4976).

Software and Other

Mentored student and post-doctoral associate co-authors are underlined.

14. [singR](#): an R package with the implementation of SING method (SIMultaneous Non-Gaussian component analysis) for data integration in neuroimaging
Authors: Wang L., **Gaynanova I.**, Risk B.
13. [bp](#): an R package for blood pressure analysis, available from Github
Authors: Schwenck, J., **Gaynanova I.**
12. [latentcor](#): an R package for estimating latent correlations from mixed data types, available from Github
Authors: Huang M., Yoon G., Müller, C, **Gaynanova I.**
11. [SLIDE](#): an R package for learning partially-shared structures from multi-view data, available from Github.
Authors: **Gaynanova I.**, Yuan D.
10. [biClassify](#): an R package for binary classification using extensions of discriminant analysis, [CRAN](#)
Authors: Lapanowski A., **Gaynanova I.**
9. Martin M., Buchanan D., Chun E., Bhat R., Cass S., Wang E., Senthil S. and **Gaynanova I.**✉ (2021). irinagain/Awesome-CGM: Updated release with simulators and enhanced processing (Version v1.1.0). Zenodo. DOI: [10.5281/zenodo.4723654](https://doi.org/10.5281/zenodo.4723654)
8. [iglu](#): an R package for interpreting data from continuous glucose monitors (CGMs), available from Github and CRAN.
Authors (Version 3.0.0): Broll S., Buchanan D., Chun E., Muschelli J., Fernandes N., Urbanek J., Seo J., Shih J., Schwenck J., Hicban M., Martin M., Patel P., Meyyappan A., Nguyen N. and **Gaynanova I.**
7. [SPRING](#): an R package for estimation of sparse microbial association networks using rank-based correlation, available from Github.
Authors: Yoon G., **Gaynanova I.**, Müller, C.
6. [sparseKOS](#): an R package for nonlinear binary classification using sparse kernel optimal scoring, available from Github.
Authors: Lapanowski A., **Gaynanova I.**

5. **JACA**: an R package for joint association and classification analysis of multi-view data, available from Github.
Authors: Zhang Y., **Gaynanova I.**
4. **mixedCCA**: an R package for semiparametric sparse canonical correlation analysis for data of mixed types (continuous/ binary/ zero-inflated), available from Github.
Authors: Yoon G., **Gaynanova I.**
3. **DAP**: an R package to perform discriminant analysis via projections, available from Github and CRAN.
Authors: Wang T., **Gaynanova I.**
2. **TREX**: a Matlab package to perform sparse linear regression using TREX, available from Github.
Authors: Müller C., Bien J., **Gaynanova I.**, Combettes P
1. **MGSDA**: an R package to perform sparse multi-group discriminant analysis, available from CRAN.
Authors: **Gaynanova I.**

Funding

As PI or Co-PI:

- NSF CAREER Award DMS-2044823 **Gaynanova I. (PI)** **06/2021 - 05/2026**
Next-generation methods for statistical integration of high-dimensional disparate data sources
Total awarded amount: \$400,000.00
- TAMU Seed Grant for Promoting Research Collaborations **Gaynanova I. (PI)** **06/2022 - 05/2023**
Modifiable risk factors and interventions in diabetes
Total awarded amount: \$10,000.
- TAMU Presidential Transformation Teaching Grant (PTTG) **Gaynanova I. (PI)** **01/2021 - 12/2022**
Total awarded amount: \$20,000.00
- TAMU College of Science **Gaynanova I. (PI)** **10/2021 - 06/2022**
Science Undergraduate Research Opportunities Program (SUROP)
Total awarded amount: \$1,820.00 (support for 1 undergraduate student).
- TAMU Institute of Data Science Postdoctoral Project Program **Ni Y. (PI)** **07/2020 - 06/2022**
Studying microbial interactions and host heterogeneity via data integration
Role: Co-PI
Total awarded amount: \$59,100.00 (50% of postdoctoral researcher support for 2 years)
- Johns Hopkins University, Subcontract **Gaynanova I. (PI)** **07/2019 - 06/2020**
Statistical Analysis of CGM Data
Total awarded amount: \$30,063.00
- NSF DMS-1712943 **Gaynanova I. (PI)** **07/2017 - 06/2020**
Scalable methods for classification of high-dimensional heterogeneous data
Total awarded amount: \$162,539.00

As Co-I:

- NSF CCF-1934904 **Mallick B. (PI)** **10/2019 - 09/2022**
 HDR Tripods: Texas A&M Research Institute for Interdisciplinary Foundations of Data Science
 Total awarded amount: \$1,416,522.00
 Role: Co-Investigator, 0% effort
- Delta Omega REDI, Texas A&M School of Public Health **Taylor N. (PI)** **06/2017 - 05/2018**
 Integrative gene expression profiling of primary colorectal cancer and adjacent extratumoral environment
 Total awarded amount: \$25,000
 Role: Co-Investigator, 0% effort

Presentations

Invited Presentations:

64. Department of Statistics and Probability, Michigan State University, September 2023
63. Celebration of Statistics and Data Science, Cornell University, September 2023
62. Department of Data Science and Operations, University of Southern California Marshall School of Business, March 2023
61. Department of Biostatistics, University of Washington, November 2022
60. Invited session, Joint Statistical Meetings, Washington DC, August 2022
59. TRICAP'22 Tensor and multiblock data analysis, Auberge Des Sequins, Luberon, France, June 2022
58. Department of Mathematics and Statistics, University of Massachusetts Amherst, May 2022
57. ENAR, Houston, TX, March 2022
56. Center for Approximation and Mathematical Data Analytics (CAMDA) seminar, Texas A&M University, March 2022
55. Department of Biostatistics, Virginia Commonwealth University, virtual due to COVID-19, December 2021
54. Missing values and Causal Inference seminar, joint between Ecole Polytechnique and INRIA Saclay, France, virtual due to COVID-19, November 2021
53. TAMIDS workshop on UQ and machine learning, Texas A&M University, November 2021
52. Department of Statistics, Penn State University, September 2021
51. ICSA Applied Statistics Symposium, virtual due to COVID-19, September 2021
50. Department of Statistics, University of Washington, virtual due to COVID-19, May 2021
49. Data & Science podcast with Glen Wright Colopy, April 2021
48. Transformational Teaching and Learning Conference, Texas A&M University, virtual due to COVID-19, April 2021
47. Pod of Asclepius, The Healthcare Technology Podcast sponsored by ASA, December 2020

46. Department of Mathematics, Statistics and Computer Science, the University of Illinois at Chicago, virtual due to COVID-19, October 2020
45. Department of Biostatistics, University of North Carolina, Chapel Hill, virtual due to COVID-19, August 2020
44. Invited session, Joint Statistical Meetings, virtual due to COVID-19, August 2020
43. 4th International Conference on Econometrics and Statistics (EcoSta 2020), Seoul, South Korea, July 2020 **(canceled due to COVID-19)**
42. Department of Biostatistics, University of Washington, May 2020 **(canceled due to COVID-19)**
41. Department of Statistics, University of Washington, May 2020 **(canceled due to COVID-19)**
40. Department of Biostatistics, Emory University, April 2020 **(canceled due to COVID-19)**
39. Banff International Research Station, workshop on the "Use of Wearable and Implantable Devices in Health Research", Banff, Canada, February 2020
38. Department of Statistics, Oregon State University, February 2020
37. The Gatsby Computational Neuroscience Unit, University College London, UK, December 2019
36. The Fourth Workshop on Higher-Order Asymptotics and Post-Selection Inference (WHOA-PSI), St. Louis, MO, August 2019
35. Topic-Contributed session, Joint Statistical Meetings, Denver, CO, July 2019
34. ICSA Applied Statistics Symposium, Raleigh, NC, June 2019
33. Econometrics and Statistics Colloquium, Booth School of Business, University of Chicago, May 2019
32. Department of Biostatistics, University of Michigan, April 2019
31. Big Data Working group, College of Veterinary Medicine, Texas A&M University, March 2019
30. Friday Science Seminar, College of Science, Texas A&M University, February 2019
29. Department of Biostatistics, University of Minnesota, February 2019
28. 11th International Conference of the ERCIM WG on Computational and Methodological Statistics (CM Statistics 2018), Pisa, Italy, December 2018
27. Bioinformatics and Cancer Symposium, Texas A&M University, September 2018
26. Topic-Contributed session, Joint Statistical Meetings, Vancouver, Canada, August 2018
25. IMS Asia Pacific Rim Meeting 2018, Singapore, June 2018
24. ICSA Applied Statistics Symposium, New Brunswick, NJ, June 2018
23. Statistical Learning and Data Science Conference, New York, NY, June 2018
22. Department of Statistics, Indiana University, April 2018
21. SAMSI Operator Splitting Workshop, Research Triangle Park, NC, March 2018
20. Department of Biostatistics, UT MD Anderson Cancer Center, March 2018
19. 10th International Conference of the ERCIM WG on Computational and Methodological Statistics (CM Statistics 2017), London, UK, December 2017
18. Department of Statistical Science, Baylor University, November 2017
17. Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, September 2017

16. Data-Driven Model Reduction Workshop, Texas A&M University, April 2017
15. Conference of Texas Statisticians (COTS), Dallas, TX, March 2017
14. ENAR, Washington DC, March 2017
13. 9th International Conference of the ERCIM WG on Computational and Methodological Statistics (CM Statistics 2016), Seville, Spain, December 2016
12. Bio-seminar, Department of Electrical and Computer Engineering, Texas A&M University, October 2016
11. Topic-Contributed session, Joint Statistical Meetings, Chicago, IL, August 2016
10. Southern Regional Council on Statistics Summer Research Conference, Bentonville, AR, June 2016
9. Structured Multivariate Data Workshop, Texas A&M University, January 2016
8. Department of Statistics, Rice University, February 2015
7. Department of Statistical Science, Cornell University, February 2015
6. Department of Statistics, Indiana University, January 2015
5. Department of Statistics, Texas A&M University, January 2015
4. Department of Mathematical and Statistical Sciences, University of Colorado, Denver, January 2015
3. Department of Statistics and Actuarial Science, University of Iowa, January 2015
2. Department of Statistics, University of California, Davis, January 2015
1. Department of Biostatistics, University of Iowa, December 2014

Contributed Presentations:

14. Poster, R/Medicine 2021, virtual due to COVID-19, August 2021
13. Presentation, ENAR, virtual due to COVID-19, March 2021
12. Poster, ENAR, Philadelphia, PA, March 2019
11. IMS New Researchers Conference, Baltimore, MD, August 2017
10. Poster, International Conference on Machine Learning in New York City, NY, June 2016
9. Contributed session, Joint Statistical Meetings in Boston, MA, August 2014
8. Statistics Student Seminar, Cornell University, April 2014
7. Poster, SAMSI LDHD Workshop, February 2014
6. Contributed session, Joint Statistical Meetings in Montreal, Canada, August 2013
5. Poster, SAMSI LDHD Summer School, August 2013
4. Statistics Student Seminar, Cornell University, March 2013
3. Contributed session, Joint Statistical Meetings in San Diego, CA, August 2012
2. Cross-Campus Collaborative Colloquium, Cornell University, December 2011
1. Statistics Student Seminar, Cornell University, September 2011

Teaching Experience

Primary instructor (at Texas A&M University):

STAT 211: Principles of Statistics I

Fall 2015/2016/2017, Spring 2016

Calculus-based introduction to probability and probability distributions; sampling and descriptive measures; inference and hypothesis testing; analysis of variance; linear regression.

STAT 489: Structured Research Experiences in Statistics

Spring 2022

Research project based on simulation studies in statistics; version control; reproducible computations; simulation study design; publication-quality figures; scientific writing.

STAT 610: Distribution Theory

Fall 2017/2018/2019/2020/2021/2022

Graduate-level introduction to probability theory; distributions and expectations of random variables, transformations of random variables and order statistics; generating functions and basic limit concepts.

STAT 689/STAT 695: Statistical Learning with Sparsity

Spring 2017/2020

Graduate-level class covering penalized empirical loss minimization methods with sparsity-inducing penalties. The course also includes brief introduction to convex optimization and duality.

STAT 600: Computational Statistics

Spring 2018, Fall 2019/2020/2021/2022

Graduate-level course on computational statistics and optimization. Topics include version control with Git and Github, code vectorization and profiling, writing R packages, introduction to convex optimization and optimization algorithms.

STAT 618: Statistical aspects of Machine Learning II

Spring 2023

Graduate-level course on statistical machine learning, a continuation of STAT 616. Topics include advanced material on statistical learning with sparsity, low-rank matrix decompositions, tensor methods, deep learning, and non-euclidean machine learning.

Primary instructor (at Cornell University):

ILRST 2100: Introductory Statistics

Winter 2013, 2014, 2015

Non-calculus-based introduction to statistics; sampling and descriptive measures; inference and hypothesis testing; analysis of variance; linear regression.

Teaching Assistant (at Cornell University):

ILRST 2100: Introductory Statistics

Summer 2013, 2014

Non-calculus-based introduction to statistics; sampling and descriptive measures; inference and hypothesis testing; analysis of variance; linear regression.

ENGRD 2700: Basic Engineering Probability and Statistics (recitation leader)

Fall 2013

Calculus-based introduction to probability and probability distributions; sampling and descriptive measures; inference and hypothesis testing; analysis of variance; linear regression.

Table 1: Summary of teaching evaluations at Texas A&M University, Q: On the whole, this was a good instructor. Scale 1(Strongly Disagree) to 5(Strongly Agree).

Course	Semester	Total class size	Mean (median) response
STAT 211	Fall 2015	77	4.68 (5.00)
STAT 211	Spring 2016	77	4.21 (4.00)
STAT 211	Fall 2016	97	4.57 (5.00)
STAT 211	Fall 2017	97	4.44 (5.00)
STAT 489	Spring 2022	8	5.00 (5.00)
STAT 610	Fall 2017	35	4.82 (5.00)
STAT 610	Fall 2018	34	5.00 (5.00)
STAT 610	Fall 2019	39	4.54 (5.00)
STAT 610	Fall 2020	33	4.80 (5.00)
STAT 610	Fall 2021	34	4.87 (5.00)
STAT 610	Fall 2022	45	4.57 (5.00)
STAT 600	Spring 2019	7	4.84 (5.00)
STAT 600	Fall 2019	31	4.73 (5.00)
STAT 600	Fall 2020	12	4.88 (5.00)
STAT 600	Fall 2021	20	5.00 (5.00)
STAT 600	Fall 2022	16	4.90 (5.00)
STAT 618	Spring 2023	8	5.00 (5.00)
STAT 689	Spring 2017	12	5.00 (5.00)
STAT 695	Spring 2020	15	5.00 (5.00)

MATH 4720: Statistics

Spring 2015

Introduction to mathematical statistics based in calculus, linear algebra, and probability theory; inference for proportions, inference for means, contingency tables and linear regression.

BTRY 6010: Statistical Methods I (TA/Lab instructor)

Fall 2009, 2010, 2014

Graduate level introduction to statistical methods for analyzing data; descriptive statistics and data visualization; analysis of variance; linear regression.

BTRY 6020: Statistical Methods II (TA/Lab instructor)

Spring 2010, 2011, 2012

Continuation of BTRY 6010. Emphasizes the use of multiple regression analysis, experimental design and generalized linear models.

Mentoring

Postdoctoral Researchers

1. Sangyoon Yi (with Raymond Wong) **09/2020 - 08/2022**
HDR Tripods: Texas A&M Research Institute for Interdisciplinary Foundations of Data Science
2. Hee Cheol Chung (with Yang Ni) **06/2020 - 06/2022**
TAMU Institute of Data Science Postdoctoral Project Program

3. Grace Yoon 08/2017 - 08/2020
 Postdoctoral Trainee of DHHS-NIH National Cancer Institute T32CA090301 (PI: R. Carroll), Gaynanova is the Statistics Mentor

PhD Committee Chair

At Texas A&M University:

- | | |
|---|-----------------|
| 1. Alexander Coulter | 2026 (expected) |
| 2. Lei Wang | 2025 (expected) |
| 3. Renat Sergazinov | 2025 (expected) |
| 4. Mingze Huang (ECON) | 2022 |
| 5. Dongbang Yuan | 2022 |
| 6. Alex Lapanowski | 2020 |
| Position upon graduation: Senior Scientist at SABIC | |
| 7. Yunfeng Zhang | 2020 |
| Position upon graduation: Data and Applied Scientist at Microsoft | |
| 8. Tianying Wang (co-chair with Raymond Carroll) | 2018 |
| Position upon graduation: Postdoctoral Research Scientist in the Department of Biostatistics of the Mailman School of Public Health at Columbia University. | |

PhD Committee Member (Statistics)

At Texas A&M University:

- | | |
|--|-----------------|
| 1. Carson James (chair Jesus Arroyo) | 2026 (expected) |
| 2. Connor Brubacker (chair Scott Bruce) | 2026 (expected) |
| 3. Jian Yan (chair Xianyang Zhang) | 2024 (expected) |
| 4. Junsouk Choi (chair Yang Ni) | 2023 (expected) |
| 5. Krystin Pantoja (chair David Jones) | 2022 |
| 6. Jiayi Wang (chair Raymond Wong) | 2022 |
| 7. Allyson Souris (chair Anirban Bhattacharya) | 2020 |
| 8. Sangyoon Yi (chair Xianyang Zhang) | 2020 |

PhD Committee Member (Other majors)

At Texas A&M University:

- | | |
|--|------|
| 1. Jianling Wang (chair James Caverlee, Major: Computer Science and Engineering) | 2022 |
| 2. Nida Obatake (chair Anne Shiu, Major: Mathematics) | 2021 |

MS Committee Chair (Statistics)

At Texas A&M University:

- | | |
|------------------|------|
| 1. Mingze Huang | 2022 |
| 2. John Schwenck | 2021 |
| 3. Rucha Bhat | 2021 |

- | | |
|----------------------|------|
| 4. Shaun Cass | 2021 |
| 5. Matthew Goldsmith | 2021 |
| 6. Neil Kirkpatrick | 2021 |

MS Committee Member (Statistics)

At Texas A&M University:

- | | |
|---------------|------|
| 1. Eric Riley | 2019 |
|---------------|------|

MS Committee Member (Other majors)

At Texas A&M University:

- | | |
|----------------------------|-----------------|
| 1. Andrea Barton (MATH) | 2023 (expected) |
| 2. Polina Churilova (PETE) | 2023 (expected) |
| 3. Aaron Knodell (CPSC) | 2019 |
| 4. Haley Pichler (MATH) | 2019 |
| 5. Jung Sim Hyun (MATH) | 2019 |

Undergraduate Student Research

At Texas A&M University:

- | | |
|--|-------------------------------------|
| 1. Nathaniel Fernandes (ENGE) | 08/2020 - 08/2021; Spring 2023 |
| 2. Akhil Cutinha (CPSC) | Fall 2022 |
| 3. Urjeet Shrestha (APMS) | Fall 2022 |
| 4. Nicholas Kasman (ENGE) | Spring 2022, Fall 2022, Spring 2023 |
| 5. Elizabeth Chun (BMCB/STAT) | 01/2020 - 05/2023 |
| 6. Melinda Chen (STAT), joint mentoring with Jesus Arroyo | Summer 2022 |
| 7. Wesley Halstead (STAT), joint mentoring with Jesus Arroyo | Summer 2022 |
| 8. Sina Mokhtar (STAT) | Summer 2022 |
| 9. Valerie Espinosa (STAT) | Summer 2022 |
| 10. Devon Maywald (APMS) | 06/2021 - 08/2022 |
| 11. Yixin Zhang (STAT) | Summer 2021 |
| 12. Kyle Schichl (STAT) | Summer 2021 |
| 13. Zengxiaoran Kang (STAT) | Summer 2021 |
| 14. Benjamin Adams (STAT) | Summer 2021 |
| 15. Jada Lawson (STAT) | Summer 2021 |
| 16. Mayra Hernandez (STAT) | Summer 2021 |
| 17. Johnathan Shih (STAT) | Spring 2021 |
| 18. Jung Hoon Seo (CPSC) | Spring 2021 |
| 19. Marielle Hicban (BMEN) | 06/2020 - 05/2021 |
| 20. David Buchanan (STAT) | 01/2020 - 05/2021 |
| 21. Ashok Meyyappan (SPSC) | Fall 2020 |
| 22. Nhan Nguyen (ENGE) | 06/2020 - 12/2020 |
| 23. Pratik Patel (STAT) | 06/2020 - 12/2020 |
| 24. Mary Martin (STAT) | 01/2020 - 12/2020 |

25. Sangaman Senthil (INEN)	Spring 2020
26. Eric Wang (ENGE)	Spring 2020
27. Steven Broll (STAT)	06/2019 - 08/2020

Academic advising

At University of Michigan:

- Zhuoxin Fu (MS), Anqi Li (MS), Jianxiong Chen (MS), Haoran Tang (MS) 2023/2024

Other formal mentoring

1. Brittany Segundo 01/2019 - 05/2023
Dr. Gaynanova is a teaching mentor through the Academy for Future Faculty (AFF) at Texas A&M University

Departmental and University Service

At University of Michigan:

Department of Biostatistics Committees:

- Candidacy Committee 09/2023 - now
- Diversity, Equity and Inclusion Committee 09/2023 - now

At Texas A&M University:

Department of Statistics Committees:

- Faculty Advisory Committee 08/2022 - 08/2023
- Promotion & Tenure Committee (Elected member) 01/2022 - 08/2023
- SOAR subcommittees (Faculty workgroup, Research Bio workgroup) 2021
- Graduate Committee 08/2019 - 08/2023
- Faculty Evaluation and Promotion Guidelines Committee 2020
- Hiring Committee 2018/2019; 2020/2021
- Colloquium Chair 05/2018 - 12/2019
- Undergraduate Committee 09/2017 - 08/2018

Panelist:

- TAMU Workshop on NSF CAREER and other Young Investigator awards 11/2021
- 3rd Annual TX-LA Undergraduate Mathematics conference 10/2019
- TAMU College of Science, Lunch and Learn series 09/2019
- TAMU Symposium for Faculty, Staff, Graduate Students and PostDocs in the Sciences 02/2017
- TAMU AWM Chapter Panel "Career in Mathematics" 03/2016

Other:

- TASTE (Take a Scientist to Lunch) College of Science Program 04/2022
- Faculty advisor for Statistical Learning Journal Club, Department of Statistics 2019 - 2020
- Friday Science Seminar, College of Science, Texas A&M University 02/2019

At Cornell University:

- President, STATS graduate student organization 11/2013 - 05/2015
- Organiser, Statistics Student Seminars 08/2011 - 12/2013

Professional Activities

Editorial service:

- Associate Editor, *Biometrika* 2023 - present
- Associate Editor, *Journal of the American Statistical Association - Theory & Methods* 2023 - present
- Associate Editor, *Data Science in Science* 2021 - present
- Associate Editor, *Journal of Computational and Graphical Statistics* 2018 - 2022

Journal refereeing:

- Annals of Applied Statistics
- Bioinformatics
- Biometrics
- Biometrika
- Computational Statistics
- Diabetes Technology and Therapeutics
- Electronic Journal of Statistics
- Journal of the American Statistical Association
- Journal of Computational and Graphical Statistics
- Journal of Machine Learning Research
- Journal of Multivariate Analysis
- IEEE Transactions on Network Science and Engineering
- PLOS One
- R journal
- Statistical Analysis and Data Mining
- Statistical Modeling: an International Journal
- Stat
- Statistics in Biosciences
- Statistics in Medicine
- Statistics & Probability Letters
- Statistica Sinica
- Technometrics

Conference refereeing:

- NIPS (Neural Information Processing Systems) 2020
- AISTATS (Artificial Intelligence and Statistics) 2020

Book proposals refereeing:

- Springer 2018

- CRC/Chapman & Hall 2017, 2018
- Wiley 2017
- MacMillan Education 2015

Grant review panels:

- NIH, Small Business: Computational, Modeling, and Biodata Management – MCST 2022
- NSF 2021
- Joint NSF/NIH panel 2016

Elected Positions:

- Program Chair-Elect 2024, ASA section on Statistical Learning and Data Science (SLDM) 2023-2024
- President, Southeast Texas Chapter of ASA (SETCASA) 02/2019-01/2020
Main activity: led, coordinated and judged SETCASA annual poster competition
- Vice-president, Southeast Texas Chapter of ASA (SETCASA) 10/2017-01/2019
Main activity: co-organized and judged SETCASA annual poster competition

Professional Committees Chair:

- Chair of ASA SLDS Student Paper Award 2021 Committee 2020/2021
- Co-chair (chair Genevera Allen) of ASA SLDS Student Paper Award 2020 Committee 2019/2020

Professional Committees Member:

- ASA SLDS Breiman Award 2022 Committee 2021/2022
- SLDS conference Student Paper Award Committee 2020
- ASA SLDS JSM 2019 Poster Competition Committee 2019
- ASA SLDS Student Paper Award 2019 Committee 2018/2019
- COTS (Conference of Texas Statisticians) Poster Competition Committee 2017
- ASA SCS John M. Chambers Statistical Software Award Committee 2015/2016

Professional Panels:

- NISS Fall 2021 Virtual Academic Career Fair; moderator 09/2021
- NISS Fall 2020 Virtual Academic Career Fair; presenter 12/2020

Conference Program Committees:

- JSM 2024 program committee, Statistical Learning and Data Science section representative 2024
- 13th International Conference of the ERCIM WG on Computational and Methodological Statistics (CM Statistics 2020) in London, UK, Scientific Program committee 2020
- ENAR 2019 program committee, Statistical Learning and Data Science section representative 2019

Sessions Organized:

- Invited Session at CM Statistics in London, UK: "Statistical methods for time-varying multivariate data" **12/2019**
- Topic-Contributed Session at Joint Statistical Meetings: "Integrative approaches for statistical analysis of data from multiple sources" **08/2019**
- Invited Session at Joint Statistical Meetings: "Discovering homology in multi-view data: new statistical methods for data integration" **08/2018**
- Topic-Contributed Session at Joint Statistical Meetings: "Exploiting Low-Dimensional Structures: Recent Advances of Statistical Learning Methods in Genetics and Genomics" **08/2016**

Sessions Chaired:

- Joint Statistical Meetings, virtual **08/2021**
- Joint Statistical Meetings, virtual **08/2020**
- CM Statistics, London, UK **12/2019**
- Joint Statistical Meetings, Denver, CO **07/2019**
- ENAR, Philadelphia, PA **03/2019**
- CM Statistics, Pisa, Italy **12/2018**
- Joint Statistical Meetings, Vancouver, Canada **08/2018**
- IMS Asian Pacific Rim Conference, Singapore **06/2018**

Membership:

- American Statistical Association (ASA) **since 2011**
- Institute of Mathematical Statistics (IMS) **since 2012**
- ENAR **since 2015**

Other:

- Docent at JSM in Boston **08/2014**